The Dragon Chip Ghost Amp

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I. SYSTEM ROLE

The Dragon Chip Ghost Amp acts as the **Central Nervous System (CNS)** and **Data Arbitrator** for a closed-loop Augmented Reality ecosystem. Its primary function is the reconciliation of asynchronous spatial telemetry from the HAWK AI Scout (120Hz) and haptic feedback loops from the Pulse Button (90Hz) to eliminate "Ghost Hand" artifacts.

II. HARDWARE ARCHITECTURE

- **Processing Core:** ARM Cortex-M7 SoC running at 480MHz for real-time interrupt handling.
- **Memory:** 2MB on-chip SRAM dedicated to high-speed Predictive Jitter Buffering.
- **Physical Form:** 45mm x 30mm Low-Profile PCB integrated into the HAWK AI Scout housing.
- **I/O:** Dual-stack BLE 5.2 radio for low-latency synchronization + USB-C for 64GB iMac terminal interfacing.
- **Power Budget:** 2.5W maximum peak, optimized for mobile/wearable creative use.

III. GHOST AMP MATHEMATICAL PROTOCOL

To reconcile spatial proximity with haptic force, the system executes a real-time transfer function:

$$F_{output} = F_{base} + (G \cdot d^{-2} \cdot m_{virtual})$$

- **F_{base}:** 0.5N (Baseline magnetorheological fluid resistance).
- **G:** Dynamic Gain Coefficient (The "Ghost Amp" intensity).
- **d:** Real-time distance between Point P (Hand) and Virtual Object center.

- **$m_{virtual}$:** Asset mass parameter (normalized 0.0 to 1.0).

Force Response Table:

| Distance (d) | Force (F) | Interaction Level |

| :--- | :--- | :--- |

| < 2mm | 8.0N | Contact Threshold (Max) |

| 5mm | 4.5N | Near-Field Manipulation |

| 10mm | 2.2N | Mid-Field Interaction |

| 25mm | 1.0N | Far-Field Awareness |

| > 50mm | 0.5N | Baseline / Out of Range |

IV. DUAL-CLOCK SYNCHRONIZATION

- **Master Timebase:** 360Hz (Least Common Multiple of 120Hz/90Hz) providing 2.78ms tick resolution.
- **Predictive Jitter Buffer:** 32ms depth using Cubic Interpolation to bridge dropped signal packets.
- **Watchdog Protocol:** Persistent 11ms 'Hard Reset' timer to prevent spatial drift.
- **Latency:** Total system round-trip capped at <8ms.

V. DEFENSIVE PRIOR ART CLAIMS

This document establishes international Prior Art for:

1. A dual-clock synchronization system using an LCM timebase to reconcile asynchronous spatial and haptic data streams.
2. A force amplification protocol (Ghost Amp) utilizing inverse-square distance modulation.
3. A predictive jitter buffer (32ms) with a hardware watchdog timer (11ms) for closed-loop stability.
4. An ARM Cortex-M7 based architecture integrating BLE 5.2 for AR peripheral coordination.

VI. ALTERNATIVE EMBODIMENTS

Claims extend to FPGA-based (Xilinx Artix-7), Custom ASIC, or DSP-based implementations, as well as standalone USB-C hub, PCIe expansion cards, or

embedded SoC configurations.